
MINIMUM FASTENER PENETRATION IN FRAMING - WOOD DIAPHRAGMS **DSA Circular 23-3**

Reference: 2001 California Building Code (CBC), Section 2315A, Tables 23A-II-H & 23A-II-I-1.

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2003 International Building Code (IBC), Section 2305, Tables 2306.3.1 & 2306.4.1.

American Forest & Paper Association 2001 Edition National Design Specification (NDS),
Supplement - Special Design Provisions for Wind and Seismic.

American Plywood Association (APA) Report T98-22; APA Form No. TT-045.

Discipline: Structural

This circular is intended for use by the DSA plan review engineers and field engineers to indicate an acceptable method for achieving compliance with applicable codes. Its purpose is to promote uniform statewide criteria for use in plan and construction review of projects within the jurisdiction of DSA. Other methods proposed by design professionals to solve a particular problem may be considered by DSA and reviewed for code compliance.

Purpose: This Circular clarifies DSA acceptance of current standards, including the 2003 edition International Building Code (IBC) and 2001 edition National Design Specification (NDS), pertaining to minimum nail penetration requirements for wood structural panel (plywood or OSB) diaphragm construction.

1. Background: The California Building Code (Tables 23A-II-H & 23A-II-I-1 in the 2001 CBC) prescribes minimum penetration of 1-1/2 inch for 8d nails and 1-5/8 inch for 10d nails into framing and blocking members for nails that attach wood structural panels.

Current standards (Tables 2306.3.1 & 2306.4.1 in the 2003 IBC) indicate minor revision of these penetration requirements, and prescribe minimum penetration of 1-3/8 inch for 8d nails and 1-1/2 inch for 10d nails. Recommended shear values and other requirements for wood structural panel diaphragm design and construction contained in these current standards remain unchanged from those contained in the 2001 edition CBC.

The 2001 CBC requirement of 1-5/8 inch minimum penetration for 10d nails precludes the use of 1-1/2 inch net thickness framing members for wood structural panel diaphragm attachment. DSA acceptance of 2003 IBC provisions permits the use of 1-1/2 inch net thickness framing members for wood structural panel diaphragm attachment.

2. Application: The minimum nail penetration of 1-3/8 inch for 8d nails and 1-1/2 inch for 10d nails prescribed in Tables 2306.3.1 & 2306.4.1 of the 2003 IBC may be used in lieu of the minimum nail penetration specified in Tables 23A-II-H and 23A-II-I-1 of the 2001 CBC.

This is applicable only to 8d or 10d nails that attach wood structural panel diaphragms to framing and blocking members. 8d or 10d nails used in any other connections (e.g. interconnection of framing members, timber connectors) shall comply with the requirements of 2001 CBC, Section 2318A.